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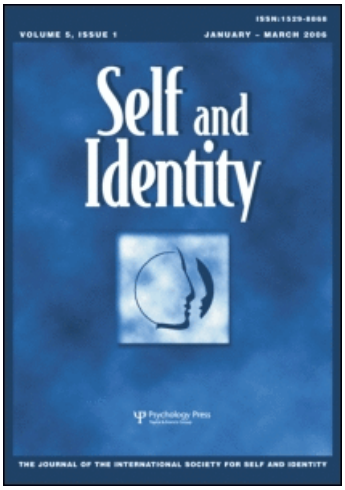

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Self-Construal and Cooperation: Is the Interdependent Self More Cooperative Than the Independent Self?

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The present study examined whether a temporary activation of independent or interdependent self-construals by priming has an influence on cooperation in social dilemmas. It was expected that individuals primed with independence would be primarily concerned with their own outcomes, whereas individuals primed with interdependence would also be concerned with the outcomes of their interaction partner. The former should therefore exhibit lower levels of cooperation. Additionally, the influence of social value orientation on cooperation was measured. Participants played 32 rounds of a give-some dilemma with an alleged interaction partner. As predicted, participants primed with independence exhibited lower levels of cooperation than participants primed with interdependence. Results are discussed in terms of their significance for research on self-construals and social dilemmas.

Research on independent vs. interdependent self-construals has become a prominent topic in social psychology. Initially, differences between cultures were studied. More recent studies have shown that different self-construals may also be activated temporarily, for example by priming (e.g., Gardner, Gabriel, & Lee, 1999; Kühnen & Hannover, 2000). Most of these studies focused on the impact of self-construals on well-being, cognition, attribution style, family obligation, etc. (cf. Oyserman, Coon, & Kemmelmeier, 2002). The current study aims to extend this research to the behavioral domain by studying the effects of salient self-construal on behavior in an interdependence situation, more specifically, cooperative behavior in a social dilemma. Based on Interdependence Theory (Kelley & Thibaut, 1978), it is assumed that activation of a specific self-construal leads to a transformation of motives, which affects the level of cooperation.

Independent vs. Interdependent Self Construals

Cultural psychology has identified the extent to which the self is defined in relation to others as a key variable distinguishing between members of Western and Eastern cultures. In Western (independent, individualistic) cultures, people perceive themselves as unique and independent from others. The self is defined mainly in

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terms of internal attributes such as abilities and attitudes (e.g., Markus & Kitayama, 1991), and the uniqueness of the self is valued highly. In Eastern (interdependent, collectivistic) cultures, people perceive themselves as connected to others, to a much greater degree the self is defined in terms of group memberships, relationships to family and friends as well as social roles. Similarities with others and common goals are therefore more important than in individualistic cultures.

The differences between individuals with an independent self-construal and individuals with an interdependent self-construal have been extensively studied by comparing people from different cultures (cf. Fiske, Kitayama, Markus, & Nisbett, 1998). However, this method potentially confounds differences in self-construals with various other variables differing between the cultures (Oyserman et al., 2002). Therefore, researchers have started to manipulate the salience of independent vs. interdependent self-construals, for example by primes (Gardner et al., 1999; Haberstroh, Oyserman, Schwarz, Kühnen, & Ji, 2002; Kühnen & Hannover, 2000; Kühnen, Hannover, & Schubert, 2001; Trafimow, Triandis, & Goto, 1991).

These studies on chronically or temporarily activated independent vs. interdependent self-construals have shown that individuals with an activated interdependent self-construal are more attentive to the (social) context in general. For example, their thinking is more context-bounded (Kühnen et al., 2001), and they are more responsive to conversational or social norms (Gardner et al., 1999; Haberstroh et al., 2002).

However, most of these studies used questionnaire data as dependent measures, but did not assess behavior in social interactions. An exception is a study by Gardner, Gabriel, and Hochschild (2002), in which independent and interdependent self-construals were primed and predictions from self-evaluation maintenance theory (SEM; Tesser, 1988) were tested. SEM proposes that when a close other performs well on a relevant task this threatens self-esteem. Consequently, people tend to react negatively to successes by close others on relevant tasks. However, Gardner et al. (2002) showed that successes of a friend became causes for celebration rather than costs to self-esteem if interdependent self-construals were primed.

One goal of the present study is to extend research on activating independent vs. interdependent self-construals to the domain of social interactions, more specifically, *cooperation in social dilemmas*. In social dilemmas, individual and collective interests are in conflict (Dawes, 1980). That is, individuals obtain higher outcomes if they pursue their individual interests than if they pursue the collective interest, and, at the same time, if all members pursue their individual interests the group members obtain lower outcomes than they would when they all pursue the collective interest. Such conflicts between individual and collective interest underlie many situations in everyday life. Examining behavior in social dilemmas is therefore not only of theoretical interest, but also of practical relevance. Moreover, the activation of an independent vs. an interdependent self-construal can be expected to play a central role in these situations because taking into account the social context, that is, the interests of the interaction partners, corresponds to a focus on the collective interest and should therefore result in higher levels of cooperation than focusing mainly on one's own outcome (individual interest).

The influence of self-construal on cooperation in social dilemmas has rarely been studied till now. Parks and Vu (1994) reported higher levels of cooperation for Vietnamese in comparison to American participants in resource dilemmas as well as in public-good dilemmas. Participants believed they were playing against another participant, but in fact played 30 rounds against preprogrammed strategies (tit-for-

tat and variations of tit-for-tat). In Study 2, one of these preprogrammed strategies was ALL-D (100% competition). Vietnamese participants exhibited not only higher levels of cooperation than the American participants, but also showed a cooperation rate of 63% (vs. 27% for the Americans), even against the ever-defecting interaction partner. Hemesath and Pomponio (1998) found higher levels of cooperation for Chinese vs. American participants in a prisoner's dilemma. Other authors argue that the ingroup – outgroup distinction is more important in collectivistic cultures than in individualistic cultures. Therefore, higher levels of cooperation with ingroup members, but lower levels of cooperation with outgroup members should be expected for people from collectivistic cultures in comparison to people from individualistic cultures (e.g., Iyengar, Lepper, & Ross, 1999; Leung & Iwawaki, 1988; Yamagishi, 1988). In all there is not much research, and even that is only cross-cultural, and it remains unclear whether different self-construals are really the *cause* for higher levels of cooperation in Eastern cultures.

In the present study, salience of self-construals was manipulated experimentally by priming. It was expected that levels of cooperation would be higher when an interdependent self-construal was activated than when an independent self-construal was activated. Additionally, the study aimed to examine the underlying process. Based on interdependence theory, it was assumed that different self-construals lead to different transformations of motivation, which in turn affect levels of cooperation.

Interdependence Theory

Kelley and Thibaut (1978) proposed the *transformation of motivation* as an underlying mechanism to explain why people do not always behave in a selfish way. They assume that the presented outcome structure of a given task, the *given matrix* of an individual, is transformed into the so-called *effective matrix*, which determines the actual behavior. Whereas the given matrix represents preferences based on pure self-interest, the effective matrix represents the influence of broader goals such as emotional reactions, cognitive interpretations, individual dispositions, relationship macromotives, or social roles and norms (cf. Rusbult & Van Lange, 1996).

In the context of social dilemmas, the influence of one dispositional variable on outcome transformation has been extensively studied: social value orientations. Social value orientations are relatively stable preferences for certain distributions of outcomes between self and other (Messick & McClintock, 1968; Van Lange, Otten, De Bruin, & Joireman, 1997). Most people can be classified as either prosocial, individualist, or competitor. Prosocials strive to maximize joint outcome, that is, they transform the given matrix into an effective matrix consisting of the sums of their own and the other's outcome. At the same time, they are also motivated to maintain equality of outcomes (Van Lange, 1999). Individualists are primarily motivated to maximize their own outcome in an absolute sense; therefore, no transformation of the given matrix takes place. Competitors aim to maximize the difference between their own and the other's outcome, their effective matrix consequently represents the difference scores. Because individualists and competitors are both concerned primarily with own outcome, either in absolute or relative terms, these two groups are often referred to as proselfs. Evidence for the assumed underlying transformation processes is reported in several studies (e.g., Dehue, McClintock, & Liebrand, 1993; McClintock & Liebrand, 1988).

In a similar vein, it can be argued that the activation of independent vs. interdependent self-construals influences the interpretation of a social dilemma situation and in turn the level of cooperation. It is hypothesized that individuals with an independent self-construal are primarily focused on their own, individual interest, that is, they should pursue an individualistic motivation. Individuals with an interdependent self-construal should take the interests of the interaction partner into account. Therefore, it is expected that people with salient interdependent self-construals exhibit higher levels of cooperation than individuals with salient independent self-construals.

In the present research, the influence of temporarily activated self-construals on cooperation is contrasted with the influence of the chronically salient social value orientations. This allows testing of whether the effects of priming and social value orientation combine additively or in an interactive way. Based on research on priming effects on person perception it can be assumed that influences from chronically (social value orientation) and temporarily (priming) activated concepts are additive (Bargh, Bond, Lombardi, & Tota, 1986). However, from research on the effects of social identification on cooperative behavior the hypothesis can be derived that the effects are stronger for proselfs. De Cremer and Van Vugt (1999) found evidence for the so-called goal-transformation hypothesis. This hypothesis states that the manipulation of social identification affects especially proselfs by inducing them to assign a greater value to the collective interest. Because prosocials assign a high value to the collective interest chronically, social identification does not lead to a large increase in cooperation rates. If one assumes that independent self-construals are chronically salient in individualistic cultures, it can be expected that activating interdependent self-construals has a larger impact on proselfs.

Method

Participants and design. Ninety-one psychology students (16 males, 75 females) of Chemnitz University of Technology participated in the experiment. Mean age of the participants was 22 years. Participants received course credit for participation and had the chance to win one of ten extra prizes of 10 € (about $10). The experiment had a 3 (social value orientation: prosocial vs. individualistic vs. competitive) × 2 (priming: independence vs. interdependence) between-participants design. Block of trials was analyzed as a within-participant variable.

Materials and procedure. Upon arrival for a study examining "decision making in social interactions", each participant was seated behind a personal computer. The computers were separated by screens to prevent visual contact. All tasks were run on the computer. First, the social value orientation of the participant was assessed with the Triple Dominance Measure of Social Value Orientation (Van Lange et al., 1997). This measure consists of nine decomposed games, in which participants have to make a choice each time between three different distributions of outcomes for themselves and the other, representing a prosocial, individualistic, or competitive social value orientation. If the participant made six or more choices consistent with one social value orientation, he/she was classified accordingly. Twenty-one participants could be classified as prosocials, 33 as individualists, and 21 as competitors. Sixteen participants did not make six or more consistent choices and were excluded from further analyses.

After a filler task, the social dilemma was explained (see below). Ten questions checked whether participants sufficiently understood the dilemma. Three participants were later excluded because they answered less than eight questions correctly. When the computer ostensibly started to connect the participant to another participant, a problem message was displayed. This message stated that at this time not all of the other participants had completed all the questionnaires and instructions, and that they would therefore first complete another task. This task was the priming manipulation (see below). After the priming task, participants played 32 rounds of the social dilemma. Lastly, participants completed a post-experimental questionnaire. Participants were asked to write down their e-mail address on a separate list. Debriefing took place via e-mail after the data collecting for the experiment was completed. The winners of the extra prizes were also informed via e-mail.

Priming. Participants had to unscramble 18 scrambled sentences. Thirteen sentences were primes, the rest were fillers. The sentences were similar to the ones used by Kühnen and Hannover (2000). In the independence priming condition, the primes contained words such as *individual, self-contained*, or *independent*, whereas in the interdependence priming condition prime words were for example *group, friendships*, or *together*.

Give-some dilemma. Participants played 32 rounds of a four-coin give-some dilemma, ostensibly with another participant. In the beginning of each round, each player had four coins, worth 1 € to him/herself, but 2 € to the other person. Participants were told that the amount of money was hypothetical, but that they could improve their chances of winning an extra bonus of 10 € by earning more "money". Thus, although hypothetical, the amount of money earned was relevant to the participants (for an identical procedure see Van Lange & Visser, 1999). (In the actual raffle, held after the experiment was completed, each participant had an equal chance of winning one of the bonuses.)

The participant then had to decide how many (0, 1, 2, 3, or 4) of his/her four coins he/she wanted to give to the other person. Similarly, the other person was supposed to decide how many of his/her four coins he/she wanted to give to the participant. The exchange of coins was then displayed on the computer screen. Then a new round started. The interaction partner was in fact preprogrammed. Mean cooperation of the interaction partner as well as cooperation in the first round was giving two coins. Within each of the eight blocks of four trials, the other gave two times two coins and one time one or three coins. Order within these four trials was randomized.

Dependent measures. The first dependent measure was actual cooperation in the dilemma game, that is the number of coins given in every round. It could also be argued that participants primed with interdependence do not enhance cooperation levels in general, but match their responses closer to the cooperation level of their interaction partner (= greater context sensitivity). Therefore, as an additional measure, the absolute values of the differences between participants' level of cooperation and cooperation of the alleged interaction partner in the round before were computed, and these 31 scores were averaged ($\alpha = .87$). A lower score on this measure is an indicator of a stronger intent to pursue a tit-for-tat strategy. To examine their interpretation of the dilemma situation, participants were also asked

to indicate the extent to which they had pursued different goals while making the choices (e.g., "I wanted as many coins as possible for myself", "I wanted the same number of coins for me and the other"). The following goals were presented: maximizing one's own gain (MaxOwn), maximizing relative gain (MaxRel), maximizing equality respectively minimizing the difference between one's own and the other's gain (MinDiff), maximizing joint gain (MaxJoint) and maximizing the other's gain (MaxOther). Answers were given on a seven-point scale.

Checks. Several questions checked for potential awareness of the priming manipulation. Participants were asked what they thought was the goal of the experiment and whether they felt that one of the earlier tasks influenced their decisions in the dilemma game. If they felt influenced, they should specify which task and in what way. Participants were also asked whether they had already participated in a similar experiment. Nine participants were excluded because they had experience with priming experiments and felt somehow influenced by the scrambled sentences task.[1] Thus, the final sample consisted of 19 prosocials, 25 individualists, and 19 competitors. Cell sizes ranged from 9 to 16.

Results

Cooperation. Mean cooperation was analyzed by a 3 (social value orientation: prosocial vs. individualistic vs. competitive) × 2 (priming: independence vs. interdependence) × 8 (block) analysis of variance with repeated measures on the last factor. This analysis yielded three significant main effects. The main effect of social value orientation, $F(2, 57) = 11.46$, $p < .001$, indicated that prosocials exhibited the highest level of cooperation ($M = 1.98$), followed by individualists ($M = 1.59$) and competitors ($M = 1.22$), ps $< .05$, Bonferroni. More important is the main effect of priming, $F(1, 57) = 4.12$, $p < .05$. Participants primed with interdependence ($M = 1.72$) showed higher levels of cooperation than did participants primed with independence ($M = 1.47$). The main effect of block, $F(7, 399) = 2.66$, $p < .05$, was due to a drop of cooperation after the first block (Means for Blocks 1 through 8 were 1.82, 1.60, 1.63, 1.59, 1.45, 1.55, 1.51, and 1.60). No interaction effect was significant, all Fs < 1.12, ps $> .34$.

Analyzing the difference score by means of a 3 (social value orientation) × 2 (priming) analysis of variance revealed a significant main effect of social value orientation, $F(2, 57) = 9.86$, $p < .01$. Prosocials differed less from their interaction partner's level of cooperation ($M = 0.74$) than did individualists ($M = 1.03$) or competitors ($M = 1.17$), $p < .05$, Bonferroni. The latter two groups did not differ significantly from each other. The main effect of priming was not significant, $F(1, 57) = 2.07$, $p = .16$. However, the interaction between priming and social value orientation was significant, $F(2, 57) = 3.21$, $p < .05$. Tests for simple main effects revealed that only competitors matched their responses closer to their interaction partner's level of cooperation when primed with interdependent self-construals ($M = 0.97$) than when primed with independent self-construals ($M = 1.38$), $F(1, 57) = 8.09$, $p < .01$. The effects for prosocials (Ms = 0.76 vs. 0.72, respectively) and individualists (Ms = 1.04 vs. 1.02, respectively) were not significant, both Fs < 1.[2]

Self-reported goals. Effects of priming and social value orientation on self-reported goals were analyzed by a multivariate analysis of variance. This analysis revealed a

significant main effect of social value orientation, $F(2, 57) = 3.23$, $p < .001$, and a marginally significant main effect of priming, $F(1, 57) = 1.98$, $p < .10$. To further scrutinize these effects, a series of univariate analyses of variance were conducted.

For all four goals, these analyses revealed significant main effects of social value orientation, $F(2, 57) = 10.47, 14.6, 11.99, 14.44$, $p < .001$, for MaxOwn, MaxRel, MinDiff and MaxJoint, respectively, and 3.69, $p < .05$ for MaxOther. The means are displayed in Table 1. The pattern was consistent and as expected: Prosocials were less motivated to maximize own and relative gain, but more motivated to minimize the difference, maximize joint gain and others' gain than individualists and in-turn competitors did.

More interesting, for MaxOwn and MaxOther significant main effects of priming occurred. Participants primed with interdependence ($M = 4.19$) were less concerned with maximizing their own gain than participants primed with independence ($M = 5.16$), $F(1, 57) = 6.58$, $p < .05$. Participants in the interdependence priming condition ($M = 3.30$) were also more willing to maximize the gain of their respective interaction partner than participants in the independence priming condition ($M = 2.37$), $F(1, 57) = 5.29$, $p < .05$. No other effects were significant, all Fs < 2.25.

Comparing the relative value assigned to MaxOwn and MaxOther in the interdependence and independence conditions revealed that participants in the interdependent self-construal condition were about equally concerned with maximizing their own and maximizing the other's gain as indicated by the non-significant difference between MaxOwn and MaxOther (Ms = 4.19 vs. 3.30, a difference of $M = 0.89$, $t(26) = 1.47$, ns.). Individuals in the independent self-construal condition on the other hand were much more concerned with maximizing their own than the other's outcome (Ms = 5.16 vs. 2.37, a difference of $M = 2.79$, $t(35) = 7.34$, $p < .001$).

To test whether the effects of priming on MaxOwn and MaxOther mediated the effects of priming on cooperation, several regression analyses were conducted. According to Baron and Kenny (1986), three regression analyses have to be conducted to test for mediation. First, the mediator is regressed on the independent variable. Second, the dependent variable is regressed on the independent variable. Third, the dependent variable is regressed on both, the independent variable and the mediator. Mediation is established if the independent variable affects both, the mediator (regression 1) as well as the dependent variable (regression 2), and if the effect of the independent variable on the dependent variable is no longer significant

TABLE 1 Self-reported Goals as a Function of Social Value Orientation

	Social value orientation		
Goal	*Prosocial*	*Individualistic*	*Competitive*
MaxOwn	3.63_a (1.89)	4.72_{ab} (1.59)	5.79_b (0.98)
MinDiff	6.05_a (1.18)	4.32_b (2.01)	3.26_b (2.02)
MaxRel	1.84_a (1.07)	3.08_a (1.93)	4.84_b (1.93)
MaxOther	3.53_a (1.74)	2.68_{ab} (1.75)	2.16_b (1.21)
MaxJoint	6.47_a (0.77)	4.96_b (1.97)	3.47_c (2.04)

Note. Answers were given on seven-point scales (1 = *not at all*, 7 = *very much*). Within each row, means with different subscripts differ significantly at $p < .05$ by Bonferroni alpha-protected comparisons.

when the mediator is included in the regression analysis (regression 3), whereas the mediator exerts a significant effect on the dependent variable.

These three regression analyses were conducted separately for MaxOwn and MaxOther. However, because of the large main effects of social value orientation on the goals, these analyses simultaneously controlled for social value orientation and the interaction terms. Including categorical variables in regression analyses affords contrast coding (Judd, 2000). Social value orientation was decomposed in two contrasts: Prosocials vs. individualists and competitors (= proselfs; 2 – 1 – 1) and individualists vs. competitors (0 1 – 1; see Judd, 2000, for details). To make the analyses more comprehensible, only the betas important for the mediation analysis are reported in the text, but not the theoretically less interesting effects of social value orientation.[3]

Regressing MaxOwn on priming—controlling simultaneously for social value orientation and the interactions terms—resulted in a significant effect of priming (the independent variable) on MaxOwn (the mediator), $\beta = -.28$, $t\ (57) = -2.57$, $p < .05$, $R^2 = .28$, $F(5, 57) = 5.84$, $p < .001$ (see Figure 1). Thus, criterion one was met. The regression of mean cooperation on priming, social value orientation and the interaction terms resembled the effects already known from the analysis of variance. As required by criterion two, priming exerted a significant effect on cooperation, $\beta = .22$, $t\ (57) = 2.03$, $p < .05$, $R^2 = .27$, $F(5, 57) = 5.54$, $p < .001$. When MaxOwn was entered in the regression, the main effect of priming was no longer significant, $\beta = .12$, $t(56) = 1.07$, ns., whereas MaxOwn still exerted a significant effect, $\beta = -.38$, $t(56) = -3.06$, $p < .01$, $R^2 = .36$, $F(6, 56) = 6.86$, $p < .001$. The indirect effect of priming on cooperation was also significant, $t(56) = 4.07$, $p < .001$ (Sobel, 1982). Thus, the effect of priming on cooperation is mediated by MaxOwn.

The same analysis was conducted for MaxOther (see Figure 2). The regression of MaxOther on priming, social value orientation and the interaction terms revealed a

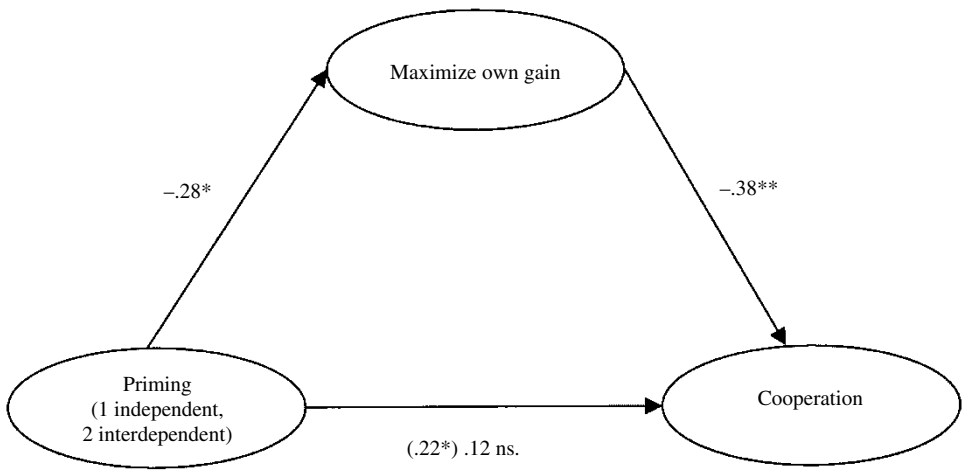

FIGURE 1 Path diagram (controlling for social value orientation and the interaction terms) of the effect of priming on mean cooperation by way of goal to maximize own outcome (MaxOwn). *Note*: Coefficients are standardized regression weights. $*p < .05$; $**p < .01$.

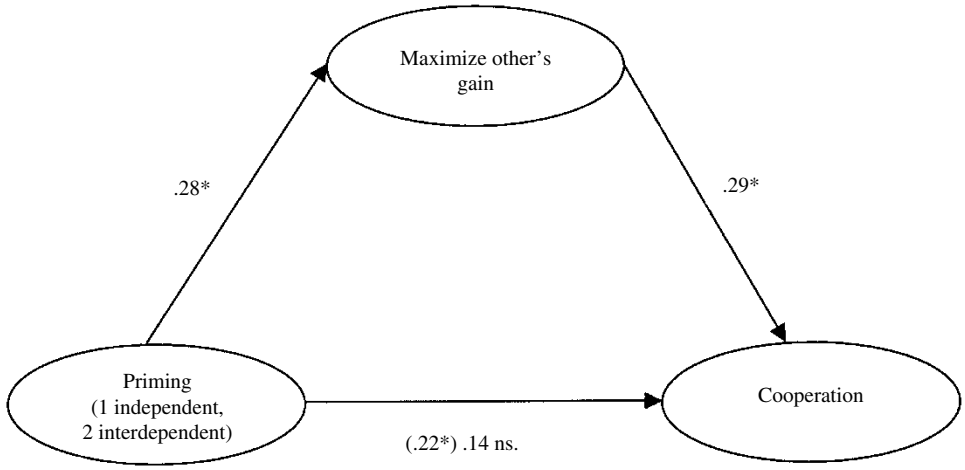

FIGURE 2 Path diagram (controlling for social value orientation and the interaction terms) of the effect of priming on mean cooperation by way of goal to maximize the other's outcome (MaxOther). *Note*: Coefficients are standardized regression weights. *$p < .05$.

main effect of priming, $\beta = .28$, $t(57) = 2.30$, $p < .05$, $R^2 = .12$, $F(5, 57) = 2.62$, $p < .05$. Regression 2 (cooperation on priming) has already been reported in the analysis for MaxOwn. The effect of priming on cooperation, $\beta = .22$, $t(57) = 2.03$, $p < .05$ was no longer significant when MaxOther was included in the regression analysis, $\beta = .14$, $t(56) = 1.30$, ns., whereas the effect of MaxOther was, $\beta = .29$, $t(56) = 2.49$, $p < .05$, $R^2 = .33$, $F(6, 56) = 6.07$, $p < .001$. The indirect effect of priming on cooperation via MaxOther was also significant, $t(56) = 3.71$, $p < .001$ (Sobel, 1982). Thus, for both goals, the effect of priming was no longer significant when goals were entered in the regression analyses, indicating that the effect of priming on cooperation is mediated by the goals MaxOwn and MaxOther.

It might also be of interest to compare the influence of MaxOwn with the influence of MaxOther. If both goals were entered simultaneously in the regression analysis, MaxOwn had a beta of $\beta = -.35$, $t(55) = -2.85$, $p < .01$, whereas MaxOther had a beta of $\beta = .25$, $t(55) = 2.25$, $p < .05$.

Discussion

The present research examined whether the temporary activation of independent vs. interdependent self-construals by priming has an effect on cooperative behavior in a social dilemma. Prior research on self-construals was thereby extended to behavior in interdependence situations. Based on interdependence theory it was assumed that individuals with an activated interdependent self-construal would focus not primarily on their own, but also on others' outcomes and therefore show higher levels of cooperation than individuals with an activated interdependent self-construal.

As expected, participants primed with interdependent self-construals showed higher levels of cooperation than individuals primed with independent self-construals. Competitors primed with interdependent self-construals were also more

responsive to the behavior of the interaction partner than when primed with independent self-construals. There was also a main effect of social value orientation. Prosocials exhibited higher levels of cooperation than individualists, followed (lastly) by competitors. Interestingly, the two effects were additive when the actual level of cooperation was used as a dependent variable, but combined in an interactive way when matching behavior was the dependent variable. This indicates that there are two processes at work. Priming interdependent self-construals primarily induces people to enhance levels of cooperation in general. However, competitors try to match their behavior closer to their interaction partner's behavior when primed with interdependent self-construals. This pattern corresponds to the goal-transformation hypothesis: competitors, the subgroup that usually maximizes the difference between own and other's outcome and is therefore least inclined to match the behavior of the interaction partner, transform their goals when interdependent self-construals are activated.

There was no interaction involving block of trials. This indicates that the priming effect is relatively stable—at least over 32 rounds. It is not the case that the activation of a self-construal has an influence on cooperation in the first round only, when no information about a partner's behavior is given and the situation is therefore somewhat ambiguous.

More important, the priming manipulation also had an effect on self-reported goals. Participants in the interdependence priming condition said they were less concerned with their own outcome and more concerned with the other's outcome, than did participants in the independence priming condition. This effect is in line with the greater sensitivity for (social) context reported in other studies (Gardner et al., 1999; Haberstroh et al., 2002; Kühnen et al., 2001).

The effects of priming on goals mediated the priming effect on cooperative behavior. That is, the activation of a specific self-construal altered the relative importance of one's own and the other's outcomes, which in turn influenced the behavior in the dilemma game. This explanation is in line with interdependence theory (Kelley & Thibaut, 1978). Individuals with an activated interdependent self-construal transform the given matrix into an effective matrix by assigning more importance to the other's outcome and less importance to their own outcome than individuals do with an activated independent self-construal. Although similar processes have been shown for people with different social value orientations (McClintock & Liebrand, 1988; Van Lange, 1999), this interpretation remains somewhat problematic because the goals were assessed in retrospect after the dilemma was played.[4] However, assessing the goals before playing the dilemma would have evoked an even higher demand character to behave consistently with the prior indicated goals. Future research is needed to further examine the validity of this interpretation.

An alternative explanation for the findings is that the priming activated rather different norms of cooperation justified in impersonal versus more interpersonal situations than independent versus interdependent self-construals. The present study did not include measures of self-construal, however, there is evidence from a study by Kühnen and Hannover (2000) that similar scrambled sentences affect perceived self–other similarity which cannot simply be explained by norms. Moreover, the two interpretations do not exclude each other. According to the semantic-procedural interface model of the self (Kühnen et al., 2001) the activation of the interdependent self renders associated semantic content areas such as social norms or concern with the expectations of interaction partners salient and activates simultaneously a more

context-bound way of thinking. The present study is a first step to show that primes used to activate independent and interdependent self-construals in other studies assessing more cognitive dependent measures (Kühnen & Hannover, 2000) also affect cooperative behavior in social interactions.

Strengths and Limitations

One strength of the current study lies in the fact that it manipulated the activation of self-construals experimentally rather than comparing people from individualistic cultures with people from collectivistic cultures. Thus, the study provides evidence that the activation of aspects of independent vs. interdependent self-construals causes differences in levels of cooperative behavior. Moreover, the present study tried to explain the underlying processes by assessing self-reported goals. The identical dilemma situation elicited different goals depending on whether an independent or an interdependent self-construal was activated. This provides at least some evidence that self-construals influence the transformation of motivation processes.

Second, the influence of independent vs. interdependent self-construals was studied in an interdependence situation. People were actively ''involved'' in a social dilemma and received immediate feedback on their actions from the alleged interaction partner. Most prior studies have examined indicators of social information processing or at-best behavior in hypothetic scenarios, but have not investigated situations in which one's own outcome was affected by the actions of an interaction partner. Whereas the dilemma game might seem somewhat artificial at first sight, it represents a conflict between individual and collective interest that also underlies many situations in everyday life. For example, in relationships one often has to choose whether or not to forego a pleasant activity that is not appreciated by one's partner. In work settings, it might be more pleasant not to invest too much time and effort in a group task, but if every team member acts this way, the group is worse off. It can therefore be expected that differences in self-construal also affect behavior in many real-life situations.

Another strength lies in the fact that social value orientations were controlled. In cross-cultural studies on cooperation in social dilemmas, social value orientations have not been assessed, thus, the possibility remains that there is a higher proportion of prosocials in collectivistic cultures. Moreover, the assessment of social value orientation allows for the comparison of the influence of chronically and temporarily activated variables. The effect of social value orientation was not overridden by the priming manipulation. Chronically and temporarily activated concepts combined additively to guide cooperative behavior (for similar findings in the domain of person perception see Bargh et al., 1986). When matching behavior was used as dependent variable, in keeping with the goal-transformation hypothesis (De Cremer & Van Vugt, 1999), the effects for competitors were stronger than the ones for individualists and prosocials.

Before closing, I should note some limitations of the current research. First, the current design did not include a control condition. Therefore, it remains unclear whether the priming of the interdependent self-construal makes people behave more cooperatively, priming of the independent self-construal makes people behave more competitively, or both. It could be argued that an independent self-construal is chronically activated in individualistic countries like Germany. In a similar vein Gardner et al. (1999) argue for American individuals. Future research is needed to

examine this question. The present research has a least shown that there are effects of a relatively subtle priming manipulation over and above personal dispositions such as social value orientation.

Another limitation might be that participants did not interact with another participant in the current study; instead, they played against a computer. This procedure was chosen because holding cooperation of the interaction partner constant over different conditions allows tracing back differences in behavior to social value orientation and the priming manipulation. Nevertheless, it would be interesting to study the effects of different self-construals on cooperative behavior in real interactions in future studies.

To conclude, the present study is a first step in examining the effects of different self-construals on behavior in interdependent situations, more specifically, on cooperation in social dilemmas. The present results showed that activating aspects of independent versus interdependent self-construals by priming leads to different levels of cooperation. Moreover, there is some preliminary evidence that independent vs. interdependent self-construals lead to different transformations of motivation, which in turn influence levels of cooperation.

Notes

1. The pattern of results remained the same when these subjects were included (Ms = 1.69 and 1.49 for the interdependent and independent self-construal priming condition), but the main effect for priming was no longer significant, $F(1, 67) = 2.36$, $p = .13$. This is in line with research showing that awareness of a prime results in contrast rather than assimilation effects (Strack, Schwarz, Bless, Kübler & Wänke, 1993).
2. Although the two dependent measures (number of coins given and the difference score) are correlated, $r(63) = -.74$, the different patterns of results indicate that they capture different aspects of cooperative behavior.
3. Regressing MaxOwn on priming, social value orientation and the interactions terms resulted also in significant effects of the two social value orientation contrasts, βs = – .44, and – .27, ts(57) = – 4.00, and – 2.44, ps $< .05$ for the contrast prosocials vs. proselfs, and the contrast individualists vs. competitors, respectively. The regression of mean cooperation on priming, social value orientation and the interaction terms revealed also effects of the two social value orientation contrasts, βs = .47, and .27, ts(57) = 4.23, and 2.46, ps $< .05$ for the contrast prosocials vs. proselfs, and the contrast individualists vs. competitors, respectively. When MaxOwn was entered in the regression, the contrast between individualists and competitors was no longer significant, $\beta = .17$, $t(56) = 1.57$, ns. The contrast between prosocials and proselfs remained significant, $\beta = .30$, $t(56) = 2.57$, $p < .05$. This indicates that the difference between individualists and competitors is mainly due to differences in the weight assumed to own outcome.

   The regression of MaxOther on priming, social value orientation and the interaction terms revealed only a significant contrast between prosocials and proselfs, $\beta = .30$, $t(57) = 2.52$, $p < .05$. However, social value orientation still had a significant influence on cooperation, βs = .38 and .23, ts(56) = 3.41 and 3.16, $p < .01$ and $p < .05$, for prosocials vs. proselfs and individualists vs. competitors, respectively.
4. Mean cooperation hardly mediates the effects of priming on MaxOwn or MaxOther. The priming effect decreases only slightly, but is still marginally significant, both βs = .20, ts(56) = 1.86 and 1.67, ps $< .05$, for MaxOwn and MaxOther, respectively.

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